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INFORMATION TECHNOLOGY PROGRAM MANAGEMENT: IS THERE A DIFFERENCE?

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June 2014

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The federal government spends billions of dollars on information technology (IT) projects each year. Despite spending billions on IT, the government has achieved little of the productivity improvements that private industry has realized from IT. Too often, federal IT projects run over budget, behind schedule, or fail to deliver promised functionality. The March 2009 Defense Science Board concluded that three root causes emerged from a review of major IT acquisition programs where cost, schedule, and performance were issues. First, senior leaders lacked experience and understanding. Second, the program executive officers and program managers had inadequate experience. Third, the acquisition process was bureaucratic and cumbersome, where many who were not accountable had to say "yes" before authority to proceed. To address these concerns, the U.S. Chief Information Officer, the Office of Personnel Management, and the Office of Management and Budget launched an initiative to strengthen program management by designing a formal IT Program Management career path. This research analyzes the need for IT Program Managers (PM) within the federal government by comparing the differences between IT PMs and non-IT PMs.

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**INFORMATION TECHNOLOGY PROGRAM MANAGEMENT:
IS THERE A DIFFERENCE?**

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INFORMATION TECHNOLOGY PROGRAM MANAGEMENT: IS THERE A DIFFERENCE?

ABSTRACT

The federal government spends billions of dollars on information technology (IT) projects each year. Despite spending billions on IT, the government has achieved little of the productivity improvements that private industry has realized from IT. Too often, federal IT projects run over budget, behind schedule, or fail to deliver promised functionality. The March 2009 Defense Science Board concluded that three root causes emerged from a review of major IT acquisition programs where cost, schedule, and performance were issues. First, senior leaders lacked experience and understanding. Second, the program executive officers and program managers had inadequate experience. Third, the acquisition process was bureaucratic and cumbersome, where many who were not accountable had to say "yes" before authority to proceed. To address these concerns, the U.S. Chief Information Officer, the Office of Personnel Management, and the Office of Management and Budget launched an initiative to strengthen program management by designing a formal IT program management career path. This research analyzes the need for IT Program Managers (PM) within the federal government by comparing the differences between IT PMs and non-IT PMs.

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LIST OF ACRONYMS AND ABBREVIATIONS

CCA	Clinger-Cohen Act
CIO	Chief Information Officer
DAB	Defense Acquisition Board
DAU	Defense Acquisition University
DOD	Department of Defense
FAC-P/PM	Federal Acquisition Certification for Program and Project Managers
FAC-P/PM-IT	Federal Acquisition Certification for Program and Project Managers with core plus specialization for IT
FAI	Federal Acquisition Institute
FARA	Federal Acquisition Reform Act
FL	functional leader
GAO	Government Accountability Office
IT	information technology
ITMRA	Information Technology Management Reform Act
IT PM	information technology program manager
KLP	key leadership position
NDAA	National Defense Authorization Act
NPS	Naval Postgraduate School
NSS	national security systems
OFPP	Office of Federal Procurement Policy
OMB	Office of Management and Budget
OPM	Office of Personnel and Management
USD (AT&L)	Under Secretary of Defense for Acquisition, Technology, & Logistics
USDA	Department of Agriculture

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I. INTRODUCTION

A. BACKGROUND

The federal government spends billions of dollars on information technology (IT) projects each year. Investing in the federal government IT infrastructure is crucial to the efficient operation of federal programs and in many cases to our national security (S. Hrg, 110–409). Despite spending billions on IT, the government has achieved little of the productivity improvements that private industry has realized from IT. Too often, federal IT projects run over budget, behind schedule, or fail to deliver promised functionality (Kundra, 2010). The March 2009 Defense Science Board concluded that three root causes emerged from a review of major IT acquisition programs where cost, schedule, and performance were issues. First, senior leaders lacked experience and understanding. Second, the program executive officers and program managers had inadequate experience. Third, the acquisition process was bureaucratic and cumbersome, where many who were not accountable had to say "yes" before authority to proceed was granted. Among these problems, lack of experience dominated (OUSD[AT&L], 2009).

To address these concerns, the U.S. CIO (Chief Information Officer), the Office of Personnel Management (OPM), and the Office of Management and Budget (OMB) launched several initiatives intended to improve the oversight and management of IT acquisitions. The first initiative came in 2010 when the White House introduced the 25 Point Implementation Plan to Reform Federal Information Technology Management. One main topic of discussion focused on strengthening program management by designing a formal IT Program Management career path. In 2011, OPM created a separate specialized job title, the IT program manager (PM), and published the IT Program Management Career Path Guide. In addition to these efforts, the DOD CIO published the IT Acquisition Workforce Strategic Plan in 2012. This plan focused on a wide-range of activities necessary to create a management structure to strengthen and grow a recognized cadre of IT PMs.

B.   PURPOSE

This research analyzes the need for IT PM positions within the federal government by comparing the differences of IT PMs and non-IT PMs. The government continues to spend billions on IT each year. Does having experienced IT PMs ensure programs are delivered on time, within budget, and with the promised capabilities? Likewise, can a non-IT PM ensure program success?

C.   RESEARCH QUESTIONS

The primary research question is: "What are the fundamental similarities and differences between IT PMs and non-IT PMs?" The subsidiary research questions are:

- What is the history of IT Program Management?

- What are the required competencies of an IT PM?

- What are the sources of education and training for an IT PM?

D.   METHODOLOGY

This project uses the following methodology:

- A literature search via the Internet, private and government databases, books and journals available in the Naval Postgraduate School Dudley Knox Library, and other available sources of relevant information.

- Additional, new, or follow-up interviews and questions via phone or email.

E.   ORGANIZATION

This study is organized into five chapters. Chapter I presents an overview of the challenges the federal government has had with managing information technology projects. Chapter II discusses the general background of IT Program Management including the supporting policies and regulations. Chapter III reviews the competencies and certifications of IT PMs compared to non-IT PMs. Chapter III also reviews the DOD Directives and Instructions that apply to IT PMs. Chapter IV draws conclusions from similarities and differences between IT and non-IT PMs. Chapter V suggests

recommendations for future research on Defense Acquisition University (DAU) and Federal Acquisition Institute (FAI) courses that provide training on developing the general competencies of IT PMs.

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II. BACKGROUND OF INORMATION TECHNOLOGY PROGRAM MANAGEMENT

A. CLINGER-COHEN ACT

The Clinger-Cohen Act (CCA) was enacted by Congress on February 10, 1996 to reform and improve the way federal agencies acquire and manage IT resources (OIG, 2000). This act may be cited as the National Defense Authorization Act of Fiscal Year 1996. The CCA is comprised of two acts: the Information Technology Management Reform Act (ITMRA) (Division E) and the Federal Acquisition Reform Act (FARA) (Division D). The ITMRA and FARA were renamed the Clinger-Cohen Act for its co-sponsors: Rep. William Clinger, R-PA, and Senator William Cohen, R-ME (www.govexec.com). This act is significant because, for the first time in law, it established the position of Chief Information Officer (CIO) in major departments and agencies within the federal government. The CIO plays a critical leadership role in driving reforms to (1) help control system development risks; (2) better manage technology spending; and (3) succeed in achieving real, measurable improvements in agency performance (OIG, 2000). "CIOs are to monitor the performance of IT programs, evaluate the performance of those programs, and advise agency heads on continuing, modifying or terminating the programs or projects" (U.S. House, 1996, p. 2).

The DOD CIO is the principle staff assistant and advisor to the Secretary of Defense for IT. This includes the national security systems, defense business systems, and information resource management (IRM) matters. The DOD CIO is responsible for all matters relating to the DOD information enterprise including: communications, spectrum management, network operations, information systems, cybersecurity, position, navigation, timing (PNT) policy, and the DOD information enterprise that supports DOD command and control (DODD 5144.2, 2013).

From an acquisition perspective, the DOD CIO will develop and maintain, in coordination with the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD (AT&L)), a process for maximizing the value of and assessing and managing the risks related to DOD IT acquisitions. This process will allow the CIO

to (1) be integrated with other key DOD decision support systems and processes that support capability identification, planning, programming, budgeting, and execution (PPBE) and acquisitions; (2) provide for analyzing, selecting, monitoring, and evaluating DOD IT investments; and (3) be performance- and results-based. The CIO also provides advice on issues related to all assigned responsibilities and functions of the Defense Acquisition Board (DAB), the Joint Requirements Oversight Council, and the Joint Capabilities Integration and Development System process (DODD 5144.2, 2013).

B.   THE 25-POINT IMPLEMENTATION PLAN TO REFORM FEDERAL IT MANAGEMENT

On December 9, 2010, the Federal CIO, Vivek Kundra, introduced the implementation plan to reform federal IT management. This plan detailed the 25 steps federal agencies must take to better manage large-scale IT programs and improve program acquisition, management, budgeting, governance and accountability; and to migrate to cloud solutions when possible (www.fdcciconnect.com). Section B of the 25 point implementation plan focuses on strengthening program management within the federal government. A shortage of qualified personnel creates challenges with program management across the federal government. Effectively managing modular IT programs requires a corps of program and project management professionals with extensive experience and robust training. Strong program management professionals are essential to effectively steward programs from beginning to end, manage the tension between on-time deliveries, and escalate issues for rapid resolution before they become roadblocks (Kundra, 2010).

OPM has taken steps to improve the IT Program Management talent in the federal government. These steps include creating a career path to attract and reward top performers, establishing integrated, multi-disciplinary program teams with key skills before beginning major IT programs, requiring managers to share best practices at the close of each program, launching a technology fellows program, and encouraging mobility of program managers across the government (Kundra, 2010). Along with creating a specialized career path for IT PMs, a separate Occupational Series specific to IT Program Management would need to be established. The development of a

competency model for IT Program Management would also be required. OPM worked with the Department of Treasury and the Department of Agriculture (USDA) to pilot the IT Program Management career track. After piloting the career paths at Treasury and USDA, OPM plans to expand the career paths more broadly across the federal government (Kundra, 2010).

C.   IT PROGRAM MANAGEMENT CAREER PATH GUIDE

In November 2011, the U.S. Office of Personnel Management (OPM), in collaboration with the Office of Management and Budget (OMB), developed the IT Program Management Career Path Guide in support of the U.S. CIO 25 Point Implementation Plan to Reform Federal Information Technology Management. The career path guide was developed to provide guidance to federal agencies interested in creating or enhancing their own IT Program Management career path (OPM, 2011b). The career path guide was based on the IT Program Management Competency Model established by OPM in July 2011. It focuses on general and technical competencies pertinent to the IT Program Management career field (OPM, 2011b). This guide also provides a career progression plan for employees to move among and across jobs in Federal IT Program Management; presents a number of success factors enabling individuals to maximize Federal IT Program Management performance and career advancement. This guide identifies key work behaviors, training options, developmental opportunities, and lists common degrees and certifications completed by IT PMs in the federal sector.

The IT Program Management Career Path Guide discusses the three job titles within the Job Family Standard for the Information Technology Management Series GS-2210. The three basic titles include IT Specialist, IT Project Manager, and IT Program Manager. The IT specialist does work that involves developing, delivering, and supporting IT systems (OPM, 2011a). The IT project manager manages IT projects to provide a unique service or product. The essential distinction between IT projects and other projects is that an IT project involves the delivery of an IT product, service, or system (OPM, 2011a). The IT PM oversees one or more major multi-year IT initiatives of

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such magnitude that they must be carried out through multiple-related IT projects. The IT PM leads, coordinates, communicates, integrates, and assumes responsibility for the overall success of the program, ensuring alignment with critical agency priorities. IT PMs are responsible for ensuring the work efforts achieve the outcome specified within the agency's business strategy, including appropriate strategic, life cycle management and capital IT investment plans. Work also includes project selection, prioritization, evaluation and monitoring, cost schedule management, risk management, quality management, and resource allocations (OPM, 2011a).

Projects have a defined beginning and end while a program constitutes an ongoing operation. This is a key distinction between the two. A project serves to develop, modify, or enhance a product, service, or system and is constrained by the relationships among scope, resources, and time. A program encompasses the missions, functions, operations, activities, laws, rules, and regulations that an agency is authorized and funded by statute to administer and enforce. Additionally, a program provides products and/or services to the public, and agencies distribute available funding and provide ongoing staff support to carry out a continuing program (OPM, 2011a).

D.   INFORMATION TECHNOLOGY ACQUISITION WORKFORCE

The IT Acquisition Workforce Strategic Plan is a plan that the Department of Defense (DOD) CIO developed to implement near term initiatives and to plan for longer term objectives associated with DOD's IT acquisition reform movement (DOD, 2012). There are four guiding strategic goals which are discussed in this plan. The workforce strategic goals are (1) create a robust, sustainable IT acquisition and IT Program Management community; (2) develop a competency model and career roadmaps for IT acquisition and IT Program Management personnel; (3) sustain learning and growth throughout the professional life cycle; and (4) work across broad stakeholder communities to integrate IT acquisition reforms into IT acquisition curricula (DOD, 2012).

Of the four strategic goals, Goal 2 focuses on supporting the IT Program Management career field. There are four actions that support developing a competency

model and career roadmaps for IT acquisition and IT Program Management. The first action was to conduct a competency review for the IT acquisition workforce. The competency model identifies competencies and proficiencies required of employees as they move along that path (DOD, 2012). The DOD CIO initiated a comprehensive IT acquisition competencies' review that aligned with a broader AT&L acquisition competency development effort to identify characteristics of successful IT acquisition workforce members (DOD, 2012). There was a four-phase process to build an IT acquisition workforce competency model. The four phases were (1) Competency Framework Development; (2) Competency Model Development; (3) Competency Model Testing & Refinement; and (4) Competency Assessment & Sustainment. The second action was to review IT acquisition career field certification requirements. This focused on entry-level and experience requirements. At the time of this writing, the IT acquisition career field certification rate was the lowest of any of the 14 acquisition fields. The IT functional leader (FL) was to review the requirements to determine the right mix of education, training, and experience needed to improve the workforce capability and quality.

The third action was to develop senior-level IT acquisition capabilities. The IT FL will partner with AT&L to develop IT acquisition key leadership positions (KLP) within the IT acquisition career field. Individuals designated as KLPs have significant responsibilities and authorities and warrant special management attention for qualification and tenure requirements. The fourth action was to develop the IT Program Management career field. The OPM, with input from agencies and the OMB, began an effort in January 2011 to create a specialized career path for IT PMs (DOD, 2012). This initiative resulted in a separate occupational title specific to IT PMs being created within the current IT Management (2210) series. The OPM also published the IT Program Management Career Path Guide (November 2011), which captured critical activities for agencies to achieve success in federal IT program management through recruitment, development, and retention of top talent (Kundra, 2012).

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III. DIFFERENCES IN INFORMATION TECHNOLOGY PROGRAM MANAGEMENT

A. COMPETENCIES

Having skilled, competent, and professional program and project managers is essential to the success of programs. Unfortunately, the subject matter competencies required for successful IT system acquisition are too often missing in program managers responsible for program execution (OUSD[AT&L], 2009). In support of the White House's 25 Point Implementation Plan, OPM, OMB, and the CIO council initiated a government-wide study to identify critical competencies for IT program and project management work. In 2011, the IT Program Management Competency Model was published to establish a baseline knowledge and skill requirement for managing IT programs. The competency model ensures that program and project managers possess the knowledge, skill, and ability necessary to advance in an IT Program Management career. The competency model also supports agency efforts in achieving success in Federal IT Program Management through workforce planning, training and development, performance management, recruitment, and selection (OPM, 2011).

The competency model for IT program management is part of the IT Program Management Career Path Guide. The model is separated by category and grade level. The two categories that reference competencies are general and technical. The grade levels listed pertain to general schedule (GS) positions for GS-13, GS-14, and GS-15. For the DOD, a GS-13 is considered an entry-level management position. Within the Army, the position is filled by a Major/O-4. A GS-14 is considered to be a mid-level management position. Within the Army, the position is filled by a Lieutenant Colonel/O-5. A GS-15 is considered to be a senior-level management position. Within the Army, the position is filled by a Colonel/O-6.

1. General Competency Model

All program managers apply common knowledge, skills, and competencies when managing programs. The general competency model identifies the competencies required to be a program manager in the professional acquisition workforce (see Table 1).

IT Program Management Competencies by Grade Level

General Competencies		
Grade 13	**Grade 14**	**Grade 15**
• Accountability • Attention to Detail • Computer Skills • Conflict Management • Creative Thinking • Customer Service • Decision Making • Flexibility • Influencing/Negotiating • Integrity/Honesty • Interpersonal Skills • Leadership • Learning • Oral Communication • Organizational Awareness • Planning and Evaluating • Problem Solving • Reading Comprehension • Reasoning • Self-Management • Strategic Thinking • Teaching Others • Teamwork • Technical Competence • Writing	• Accountability • Attention to Detail • Computer Skills • Conflict Management • Creative Thinking • Customer Service • Decision Making • Flexibility • Influencing/Negotiating • Integrity/Honesty • Interpersonal Skills • Leadership • Learning • Oral Communication • Organizational Awareness • Partnering • Planning and Evaluating • Political Savvy • Problem Solving • Reading Comprehension • Reasoning • Self-Management • Strategic Thinking • Teaching Others • Teamwork • Technical Competence • Vision • Writing	• Accountability • Attention to Detail • Computer Skills • Conflict Management • Creative Thinking • Customer Service • Decision Making • External Awareness • Flexibility • Influencing/Negotiating • Integrity/Honesty • Interpersonal Skills • Leadership • Learning • Managing Human Resources • Oral Communication • Organizational Awareness • Partnering • Planning and Evaluating • Political Savvy • Problem Solving • Reading Comprehension • Reasoning • Self-Management • Strategic Thinking • Teaching Others • Teamwork • Technical Competence • Vision • Writing

Table 1. IT Program Management General Competency Model (from OPM, 2011).

2. Technical Competency Model

In addition to the knowledge, skills, and competencies required of all program managers (see Table 2), specifically the IT PM also requires specific knowledge, skills, and competencies in managing IT programs. The technical competency model identifies the minimum competencies by position. This is required to specialize as an IT PM in the professional acquisition workforce.

IT Program Management Competencies by Grade Level

Technical Competencies		
Grade 13	**Grade 14**	**Grade 15**
• Change Management • Configuration Management • Cost-Benefit Analysis • Data Management • Information Assurance • Information Management • Information Resources Strategy and Planning • Project Management • Quality Assurance • Requirements Analysis • Risk Management • Systems Life Cycle • Systems Testing and Evaluation • Technology Awareness	• Acquisition Strategy • Change Management • Configuration Management • Contracting/Procurement • Cost-Benefit Analysis • Financial Management • Information Assurance • Information Technology Program Management • Project Management • Quality Assurance • Requirements Analysis • Risk Management • Stakeholder Management • Systems Life Cycle • Technology Awareness	• Acquisition Strategy • Capital Planning and Investment Assessment • Change Management • Compliance • Configuration Management • Contracting/Procurement • Cost-Benefit Analysis • Data Management • Enterprise Architecture • Financial Management • Information Assurance • Information Management • Information Resources Strategy and Planning • Information Systems Security Certification • Information Technology Architecture • Information Technology Program Management • Project Management • Quality Assurance • Requirements Analysis • Risk Management • Stakeholder Management • Systems Engineering • Systems Life Cycle • Systems Testing and Evaluation • Technology Awareness

Table 2.   IT Program Management Technical Competency Model
(from OPM, 2011).

B.   CERTIFICATIONS

Two institutions can certify IT and non-IT Program and IT Project Managers. The Defense Acquisition University (DAU) certifies DOD civilian employees and military Soldiers and Officers assigned. Also, it will include an assignment to an acquisition coded position (www.DAU.mil). The second is the Federal Acquisition Institute (FAI). They certify all federal employees of executive branch agencies.

1.   Defense Acquisition University

In 1991, the Defense Authorization Act, Public Law 101–510 was instituted. It called for establishing an Acquisition Corps and professionalizing the acquisition workforce through education, training, and work experience (Garcia, Keyner, Robillard, & VanMullekom, 1997). As a result of this act, the Defense Acquisition Workforce Implementation Act was enacted to improve the effectiveness of personnel who managed and implemented defense acquisition programs. The Defense Acquisition University was established to:

(1) Educate and train professionals for effective service in the defense acquisition system (2) achieve more efficient and effective use of available acquisition resources by coordinating DOD acquisition education and training programs and tailoring them to support the careers of personnel in acquisition positions and (3) develop education, training, research, and publication capabilities in the area of acquisition. (DODD 5000.57, 1991, p. 2)

Additionally, DAU would be responsible for the research and analysis of defense acquisition policy issues from an academic perspective (PL 101–510, 1990). The training standards, requirements, and courses have been modified over time to meet the ever-changing acquisition environment.

To be considered Level 1-certified in IT, a DOD employee or military officer has to meet the core certification standards found in Table 3. To be Level 1-certified in Program Management, a DOD employee or military officer has to meet the core certification standards found in Table 4.

CERTIFICATION STANDARDS & CORE PLUS DEVELOPMENT GUIDE INFORMATION TECHNOLOGY LEVEL1	
Core Certification Standards (Required for DAWIA certification.)	
Acquisition Training	● ACQ 101 Fundamentals of Systems Acquisition Management
Functional Training	● IRM 101 Basic Information Systems Acquisition ● or ● SAM 101 Basic Software Acquisition Management
Education	● Formal education not required for certification
Experience	● 1 year of acquisition experience in information technology

Table 3.   Information Technology Level 1 Certification Standard (after DAU, 2014)

CERTIFICATION STANDARDS & CORE PLUS DEVELOPMENT GUIDE PROGRAM MANAGEMENT LEVEL1	
Core Certification Standards (Required for DAWIA certification.)	
Acquisition Training	● ACQ 101 Fundamentals of Systems Acquisition Management
Functional Training	● SYS 101 Fundamentals of Systems Planning, Research, Development, and Engineering ● CLB 007 Cost Analysis ● CLV 016 Introduction to Earned Value Management
Education	● Formal education not required for certification
Experience	● 1 year of acquisition experience ● ● Effective 1 October 2014 the requirement changes to: ● 1 year of acquisition experience with cost, schedule, and performance responsibilities

Table 4.   Program Management Level 1 Certification Standard (after DAU, 2014)

To be considered Level 2-certified in IT, a DOD employee or military officer has to meet the core certification standards found in Table 5. To be Level 2-certified in Program Management, a DOD employee or military officer has to meet the core certification standards found in Table 6.

CERTIFICATION STANDARDS & CORE PLUS DEVELOPMENT GUIDE INFORMATION TECHNOLOGY LEVEL2	
Core Certification Standards (Required for DAWIA certification.)	
Acquisition Training	● ACQ 201A Intermediate Systems Acquisition, Part A ● ACQ 201B Intermediate Systems Acquisition, Part B (R)
Functional Training	● IRM 202 Intermediate Information Systems Acquisition (R)
Education	● Formal education not required for certification
Experience	● 2 years of acquisition experience in information technology

Table 5.   Information Technology Level 1 Certification Standard (after DAU, 2014)

CERTIFICATION STANDARDS & CORE PLUS DEVELOPMENT GUIDE PROGRAM MANAGEMENT LEVEL2	
Core Certification Standards (Required for DAWIA certification.)	
Acquisition Training	● ACQ 201A Intermediate Systems Acquisition, Part A ● ACQ 201B Intermediate Systems Acquisition, Part B (R)
Functional Training	● PMT 251 Program Management Tools Course, Part I ● PMT 257 Program Management Tools Course, Part II ● CON 121 Contract Planning ● CON 124 Contract Execution ● CON 127 Contract Management ● and either of the following completed on or after Nov 15, 2005 ● SAM 101 Basic Software Acquisition Management ● or ● IRM 101 Basic Information Systems Acquisition ● ● Effective 1 October 2014 the below course is added as a requirement: ● EVM 101 Fundamentals of Earned Value Management
Education	● Formal education not required for certification
Experience	● 2 years of acquisition experience; at least 1 year of this experience must be in program management ● ● Effective 1 October 2014 the requirement changes to: ● 2 years in program management with cost, schedule, and performance responsibilities

Table 6.   Program Management Level 2 Certification Standard (after DAU, 2014)

To be considered Level 3- certified in Information Technology, a DOD employee or military officer has to meet the core certification standards found in Table 7. To be Level 3-certified in Program Management, a DOD employee or military officer has to meet the core certification standards found in Table 8.

CERTIFICATION STANDARDS & CORE PLUS DEVELOPMENT GUIDE	
INFORMATION TECHNOLOGY LEVEL3	
Core Certification Standards (Required for DAWIA certification.)	
Acquisition Training	● None Required
Functional Training	● IRM 304 Advanced Information Systems Acquisition (R) ● SAM 301 Advanced Software Acquisition Management (R)
Education	● Formal education not required for certification
Experience	● 4 years of information technology or software-intensive systems acquisition experience

Table 7.   Information Technology Level 3 Certification Standard (after DAU, 2014)

CERTIFICATION STANDARDS & CORE PLUS DEVELOPMENT GUIDE	
PROGRAM MANAGEMENT LEVEL3	
Core Certification Standards (Required for DAWIA certification.)	
Acquisition Training	● None required
Functional Training	● BCF 103 Fundamentals of Business Financial Management ● EVM 101 Fundamentals of Earned Value Management ● LOG 103 Reliability, Availability, and Maintainability (RAM) ● PMT 352A Program Management Office Course, Part A ● PMT 352B Program Management Office Course, Part B (R) ● SYS 202 Intermediate Systems Planning, Research, Development, and Engineering, Part I ● ● Effective 1 October 2014, EVM 101 becomes a Level II requirement vice a Level III requirement.
Education	● Formal education not required for certification.
Experience	● 4 years acquisition experience with at least: ● - 2 years in a program office/similar organization (dedicated matrix support to a PM, PEO, DCMA program integrator, or supervisor of shipbuilding) ● - 1 year in a program management position with cost, schedule, and performance responsibilities ● ● Effective 1 October 2014 the requirement changes to: ● 4 years in program management with cost, schedule and performance ● At least 2 years in a program office or similar organization (dedicated matrix support to a PM, PEO, DCMA program integrator, or supervisor of shipbuilding). These two years may run concurrent with the preceding 4 year requirement. ● OR ● Level III DAWIA certification in a another acquisition functional ● 2 years in program management with cost, schedule and performance ● 2 years in a program office or similar organization (dedicated matrix support to a PM, PEO, DCMA program integrator, or supervisor of shipbuilding). These 2 years may run concurrent with the preceding Level III or 2 year requirements.

Table 8.   Management Level 3 Certification Standard (after DAU, 2014)

2.   Federal Acquisition Institute

The Services Acquisition Reform Act of 2003, Public Law 108–136, expanded the definition of acquisition to include functions performed by program and project managers (OMB, 2013). The Office of Federal Procurement Policy (OFPP) Policy Letter 05–01— *Developing and Managing the Acquisition Workforce*—built upon this broader definition of acquisition workforce. It required the Federal Acquisition Institute (FAI) to make recommendations for a program and project management certification program (Administrator OMB, 2007). FAI fosters and promotes the development of professional acquisition workforce personnel and performs a wide range of activities supporting the management of the acquisition workforce.

In April 2007, the Federal Acquisition Certification for Program and Project Managers (FAC-P/PM) was created to provide general training and experience requirements for program and project managers in civilian agencies. Individuals certified under the FAC-P/PM program met the general program management competencies and experience of the IT PM qualification guidance. They also had to meet the technical standards to fully satisfy the IT PM requirements. In July 2011, OFPP introduced the concept of a core-plus certification for IT acquisition professionals. The FAC-P/PM-IT was meant for those program and project managers responsible for the acquisition of IT assets.

The FAC-P/PM is founded on "(1) core competencies that are considered essential for successful program and project management; (2) experience requirements; and (3) continuous learning to maintain skills currency" (Administrator OMB, 2013, p. A-3). FAC-P/PM contains three levels of certification: entry-, mid- and senior-level. Program and project managers may only be certified at a certain level after they achieve all competencies for that certification level. FAC-P/PM certification requirements are detailed in Table 9.

FAC-P/PM Certification Requirements

Senior-Level P/PM
- Achieve senior-level and appropriate lower level competencies*
- Four years of program or project management, which shall include a minimum of one year of experience on federal programs and/or projects. within the last ten years **

Mid-Level P/PM
- Achieve mid-level and appropriate lower level competencies*
- Two years of program or project management experience within the last five years**

Entry-Level P/PM
- Achieve entry-level competencies*
- One year of project management experience within the last five years**

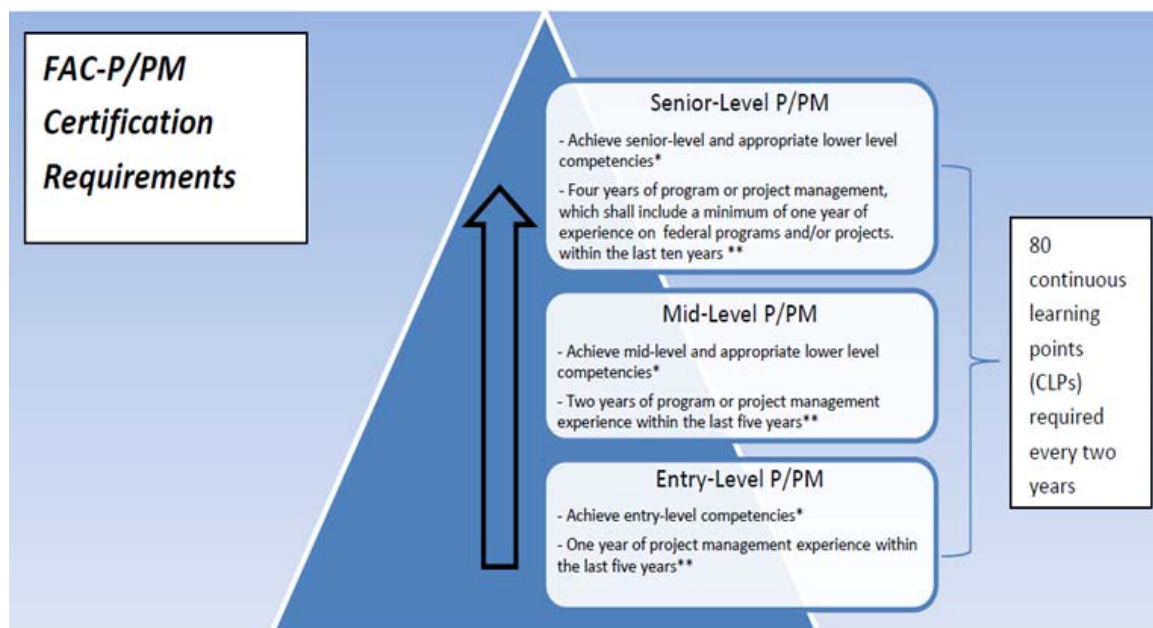80 continuous learning points (CLPs) required every two years

Table 9.   Federal Acquisition Certification for Program and Project Managers (FAC-P/PM) (from FAI, 2014)

The FAC-P/PM-IT is for PMs and project managers managing IT programs that support or have key integration functions with major non-IT programs. They shall be at least mid-level certified. PMs or project managers managing major IT programs shall hold senior level FAC-P/PM-IT specialization. The ability to specialize implies a demonstrated level of skill beyond the entry level. Thus, the IT specialization will be granted to holders of mid- and senior-level FAC-P/PMs. An acquisition workforce member can satisfy the core-plus competency requirements through training, education, other relevant certification programs, or demonstrated and documented through fulfillment of knowledge, skills, and abilities (Administrator OMB, 2013). FAC-P/PM-IT certification requirements are detailed in Table 10.

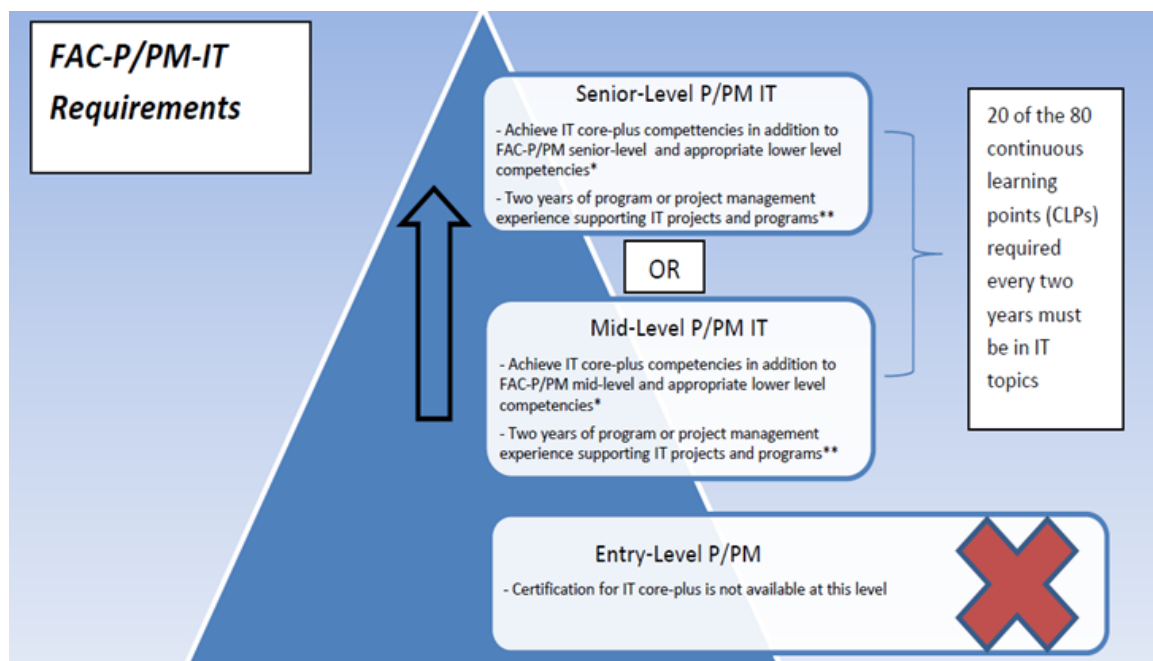Table 10.   Federal Acquisition Certification for Program and Project Managers Core-plus IT Specialization (FAC-P/PM-IT) (from FAI, 2014)

C.   REGULATORY GUIDELINES AND POLICIES

The specific DOD guidelines and policies that pertain to IT PM are: the 25 Point Implementation Plan to Reform Federal IT Management; the IT Program Management Career Path Guide; and the IT Acquisition Workforce Strategic Plan. These guidelines

and policies were covered in Chapter II. The following directives and instructions apply to the management of information technology, but can be performed by IT or non-IT PMs.

1.   DOD Instruction 8500.01–Cybersecurity/Information Assurance

Program managers must ensure cybersecurity requirements are identified and included throughout the life cycle of systems including acquisition, design, development, developmental testing, operational testing, integration, implementation, operation, upgrade, or replacement of all DOD IT supporting DOD tasks and missions (DODI 8500.01, 2014). According to cybersecurity policy, "All IT that receives, processes, stores, displays, or transmits DOD information will be acquired, configured, operated, maintained, and disposed of consistent with applicable DOD cybersecurity policies, standards, and architectures" (DODI 8500.01, 2014, p. 4). DODI 8500.01 defines cybersecurity as:

> The prevention of damage to, protection of, and restoration of computers, electronic communications systems, electronic communications services, wire communication, and electronic communication, including information contained therein, to ensure its availability, integrity, authentication, confidentiality, and nonrepudiation. (p. 55)

In addition to PMs managing the cybersecurity requirements throughout the life cycle, the DOD 8500.01 states acquisition personnel with "IT development responsibilities" are to be qualified in accordance with the Information Assurance Workforce Improvement Program. This requirement means a PM must obtain and maintain a certification corresponding to the highest level function performed. The DOD IA workforce is split into two major categories of Technical and Management. Both categories are comprised of three levels: I, II, and III. IT PMs would not perform IAT functions as they are technical in nature.

2.   DOD Directive 5000.01–The Defense Acquisition System

The Defense Acquisition System exists to manage the nation's investments in technologies, programs, and product support necessary to achieve the National Security Strategy and to support the United States Armed Forces (DODD 5000.01, 2007). This

directive describes the overarching management principles and mandatory policies. The areas that apply to programs containing information technology are Information Assurance, Information Superiority, and Interoperability. The Information Assurance section states that "Acquisition managers shall address information assurance requirements for all weapon systems; Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance systems; and information technology programs that depend on external information sources or provide information to other DOD systems." The Information Superiority section states the following:

> Acquisition managers shall provide U.S. Forces with systems and families of systems that are secure, reliable, interoperable, compatible with the electromagnetic spectrum environment, and able to communicate across a universal information technology infrastructure, including national security systems (NSS), consisting of data, information, processes, organizational interactions, skills, analytical expertise, other systems, networks, and information exchange capabilities. (DODD 5000.01, 2007, p. 6)

> The Interoperability section states that:

> Systems, units, and forces shall be able to provide and accept data, information, materiel, and services to and from other systems, units, and forces and shall effectively interoperate with other U.S. Forces and coalition partners. Joint concepts and integrated [solution] architectures shall be used to characterize these interrelationships. (DODD 5000.01, 2007, p. 7)

Each section has a specific directive that provides details on how IT is applicable to program managers.

3. DOD Directive 5000.02–Operation of the Defense Acquisition System

The overarching management principles and mandatory policies that govern the Defense Acquisition System are described in DOD Directive 5000.01. This directive provides the detailed procedures that guide the operation of the system. Enclosure 11 describes the requirements applicable to all programs containing information technology. Program managers that manage IT projects and/or programs have to comply with the 14 policies and procedures contained in this directive. Even though the policies and procedures are specific to IT, any program manager can execute them.

4.   DOD Directive 4630.05–Interoperability and Supportability of Information Technology and National Security Systems

This directive requires IT and NSS employed by U.S. forces to interoperate with existing and planned systems and equipment of joint, combined, and coalition forces and with other U.S. government departments and agencies (DODD 4630.05, 2004). Program managers shall make certain that IT and NSS interoperability be verified early and with sufficient frequency throughout a system's life. This also applies to changes affecting interoperability or supportability, to assess, evaluate, and certify its overall interoperability and supportability within a given capability (DODD 4630.05, 2004).

5.   DOD Directive 8000.01–Management of the Department of Defense Information Enterprise

This section discusses the DOD Information Enterprise and its role in helping program managers describe their transition from the current environment to the future net-centric environment. Consistent with DODD 5000.01 and DODI 5000.02:

> Acquisition strategies shall appropriately allocate risk between the Government and contractor; effectively use competition; tie contract payments to performance; and, where practicable, take maximum advantage of commercial off-the-shelf and non-developmental item technology. Information solutions shall be structured into useful segments that are as narrow in scope and brief in duration as practical; each segment shall solve a specific part of an overall mission problem and deliver a measurable net benefit independent of future segments (DODD 8000.01, 2009, p. 3).

6.   Defense Acquisition Guidebook

Chapter VII of the Defense Acquisition Guidebook (DAG) discusses how DOD complies with statutory and regulatory requirements for acquiring IT and NSS. This includes using a network-centric strategy to transform DOD warfighting, business, and intelligence capabilities. This chapter also provides descriptions and explanations of the Clinger-Cohen Act and many other associated topics and concepts, and discusses many of the activities that enable the development of net-centric systems (DAG, 2012).

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IV.   ANALYSIS

A.   INTRODUCTION

This chapter discusses the similarities and differences between IT PMs and non-IT PMs. The first section discusses the competencies that were identified in Chapter III. The second section reviews the certification requirements for becoming an IT PM. The remainder of this chapter covers the cybersecurity requirements for PMs charged with IT development responsibilities.

B.   PM COMPETENCY ANALYSIS

An analysis between general and technical competencies was conducted to determine which competency model was essential in managing IT programs.

1.   General vs. Technical Competency Models

The general competencies listed in Table 1 are required for all program managers. The higher a PM's grade, the more competencies are required for that position. This study's research discovered that general competencies are the most important for achieving success as a program or project manager. Leadership stands above all other competencies and is the primary role of a program manager. History has shown that without strong leadership, teams are likely to stray from sound fundamentals and implement high-risk shortcuts, placing the project in jeopardy (Forsberg, Mooz & Cotterman, 2005). A report conducted by the Project Management Institute (PMI) (Figure 1) also identifies leadership as the most important skill to manage a program or project.

Most Important Skills to Successfully Manage Highly Complex Projects

Leadership skills	81%
Technical project management skills	9%
Strategic and business management skills	9%
Other	1%
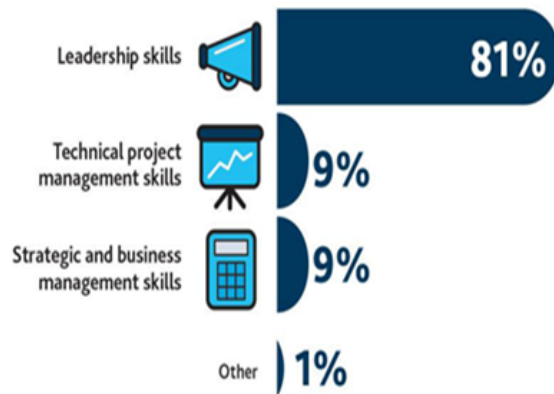
Source: ©2013 Project Management Institute, Inc.
Pulse of the Profession™ In-Depth Report: Navigating Complexity, September 2013. PMI.org/Pulse

Figure 1.   Most Important Skills to Successfully Manage Highly Complex
Projects (from PMI, 2013)

PMs need to have good "soft skills" to achieve success on programs or projects. Some soft skills include communication, influencing, negotiating, conflict management and problem solving. For PMs to meet stakeholders' needs and expectations, they must be able to communicate, negotiate, influence, and solve problems within their organization. PMs need to actively listen to their teams and assist in developing new approaches for solving problems and then influence the team to achieve the program or project goals. It's important for PMs to have organizational awareness and political savvy to understand their social, physical, and political environment. Organizational issues are often the most difficult part of working on and managing projects (Schwalbe, 2006). Lastly, PMs must remain flexible to deal with the complex and rapidly changing environment when working towards program or project goals.

The technical competencies listed in Table 2 are required for IT PMs. Not all of the competencies are IT-specific. By taking a closer look, some competencies are considered common knowledge and skills for all PMs. For example, cost-benefit analysis, requirements analysis, and risk management are all common skills a PM should possess.

Technical Competencies
Grade 15
• Acquisition Strategy • Capital Planning and Investment Assessment • Change Management • Compliance • Configuration Management • Contracting/Procurement • Cost-Benefit Analysis • Data Management • Enterprise Architecture • Financial Management • Information Assurance • Information Management • Information Resources Strategy and Planning • Information Systems Security Certification • Information Technology Architecture • Information Technology Program Management • Project Management • Quality Assurance • Requirements Analysis • Risk Management • Stakeholder Management • Systems Engineering • Systems Life Cycle • Systems Testing and Evaluation • Technology Awareness

Table 11.   Technical Competencies for IT (after OPM, 2011)

Of the 25 technical competencies listed in the GS-15 column, only 32% are considered IT-specific knowledge, skills, and abilities. The remaining 68% relate to knowledge, skills, and abilities of non-IT PMs. These statistics indicate that general competencies are more important than technical as they relate to the differences between IT and non-IT PMs. While it is recommended that IT PMs have some working knowledge in the field of IT, they do not necessarily have to be experts on any specific technology. PMs need to know enough to build strong teams and to ask the right questions. Consequently, it might be difficult for a PM with little or no experience in IT

to become the program manager of a large IT program or project. A potential setback could be earning the respect of the project team. But when a PM is an IT expert, the PM may only focus on enhancing technical skills. Some IT experts do not see how soft skills or business skills will improve their performances or increase their salaries. This is another potential setback of selecting a PM with a strong background in IT.

The Government Accountability Office (GAO) conducted a study which identified seven successful federal IT investments that achieved their respective cost, schedule, and performance goals. GAO identified nine common factors that were critical to the success of three or more of the seven IT investments. The nine critical success factors are shown in Table 12 and the Federal Department IT investments are shown in Table 13.

Commonly Identified Critical Success Factors across Seven Successful IT Investments

| Critical success factors | Investments | | | | | | |
	DRIS	GCSS-J	MOMentum	WHTI	ITWS	CADE 2	OHRS
1 Program officials were actively engaged with stakeholders.	X	X	X	X	X	X	X
2 Program staff had the necessary knowledge and skills.	X		X	X	X	X	X
3 Senior department and agency executives supported the programs.	X	X		X	X	X	X
4 End users and stakeholders were involved in the development of requirements.	X	X	X		X		X
5 End users participated in testing of system functionality prior to formal end user acceptance testing.		X	X	X	X		X
6 Government and contractor staff were consistent and stable.	X	X		X	X		
7 Program staff prioritized requirements.		X	X		X		X
8 Program officials maintained regular communication with the prime contractor.	X		X	X			X
9 Programs received sufficient funding.	X			X		X	

Source: GAO analysis of agency data.

Table 12.   Commonly Identified Critical Success Factors across Seven Successful IT Investments (from GAO, 2011)

Investments Identified as Successful by Federal Departments

Department	Investment
Commerce	Decennial Response Integration System
Defense	Global Combat Support System-Joint, Increment 7
Energy	Manufacturing Operations Management (MOMentum) Project
Homeland Security	Western Hemisphere Travel Initiative
Transportation	Integrated Terminal Weather System
Treasury	Customer Account Data Engine 2 (CADE 2)
Veterans Affairs	Occupational Health Record-keeping System

Source: Agency data.

Table 13.　　　Investments Identified as Successful by Federal Departments
(from GAO, 2011)

Of the nine critical factors listed, over half incorporated general competencies that contributed to the successful acquisition of IT investments. None referenced the program manager needing IT technical competencies to be successful. The GAO concluded their report by stating that the implementation of these factors will not necessarily ensure successful IT acquisitions; nevertheless, these factors may help federal agencies address the IT acquisition challenges. The following are comments cited from agency officials that participated in the report:

- Internal Revenue Service (IRS) officials stated that consistent and open communication with internal and external stakeholders was critical to the success of their program.

- National Nuclear Security Administration (NNSA) stated that notifying stakeholders of potential issues as soon as they were identified helped foster transparency and trust.

- Customs and Border Protection (CBP) officials noted almost every member working on the team had a good understanding of acquisitions including an understanding of program management.

- The NNSA selected a program manager from the end user organization as opposed to an individual with an IT background. The individual selected has decades of experience managing shop floor control systems. He was well aware of how the work on the shop floor was done and focused on safely delivering the necessary functional requirements to the end user.

- Veterans Affairs (VA) officials stated that ensuring a positive, non-adversarial relationship between prime contractor and the program management office was critical to the success of the investment.

In conclusion, these examples demonstrate a program manager can successfully manage large, complex IT programs by combining program management knowledge with general competencies.

C.   CERTIFICATION FOR IT PM

As stated in Chapter III, the two institutions that certify IT and non-IT program and project managers are DAU and FAI. DAU certifies DOD civilian employees and military officers while FAI certifies all federal employees of the executive branch agencies. An analysis of the two institutions was conducted, and both share similarities and differences for developing and strengthening IT PMs. Both institutions cover the core competencies, but they differ on when the knowledge and experience is necessary for certification. FAI does not provide a specific curriculum for training and DAU IT certification lacks mandatory program management functional training.

1.   DAU IT vs. FAI IT PM Certification Standards

FAI requires program managers seeking core-plus specialty in IT acquisitions be certified as mid-level program managers. PMs are also required to have at least two years' experience in managing IT programs or projects. There are two certification levels for IT PMs: mid and senior. PMs that manage major IT investments will hold the senior level IT specialty. The certification requirements for entry-, mid-, and senior-level PM are listed in Table 1. In addition to program management entry- and mid-level competencies, PMs must achieve IT core-plus competencies prior to being granted PM core-plus IT specialization or IT PM certification. To be certified as entry, mid, and senior level, FAI requires program managers to demonstrate seven core PM competencies. The competencies required are: (1) Requirements Development and Management Processes, (2) Systems Engineering, (3) Test and Evaluation, (4) Life Cycle Logistics, (5) Contracting, (6) Business, Cost and Financial Management, and (7) Leadership. Each of these core competencies ensure program and project managers

possess the common skills and experience necessary to excel in the PM functional area. The competencies for IT-specialization are listed in Table 2. The majority apply to the senior-level position. As stated earlier, two years of experience is required to manage IT programs or projects. At a minimum, the experience must include the following: the identification of IT system requirements; the use or knowledge and familiarity of modular development methodologies; system integration into an Enterprise Architecture; and IT system testing and evaluation. FAI does not provide a specific curriculum for training. Training vendors are given the flexibility to tailor their instructional methods to deliver learning outcomes that align to the core competencies. FAI accepts training from multiple sources. These include industry training vendors, colleges and universities, and federal training institutions and academies. A list of providers offering PM certification training can be found on www.FAI.gov. The sources are updates periodically.

According to DAU, civilians seeking certification in the IT acquisition career field can do so with no prior program management experience. Civilians can take two courses, have one year of IT experience, and meet the Level 1 IT requirement. Military officers assessed in the acquisition workforce are offered five career fields with program management and contracting being the most preferred. Officers are highly discouraged from applying for other DAU certifications until Level 3 of their functional area is achieved. The three certification levels for IT acquisitions are Level 1, Level 2, and Level 3. The certification requirement for each level is listed in Tables 3, 5 and 7. DAU has a core-plus development guide that offers optional courses to obtain additional knowledge, skills, and abilities. Providing courses that are "mandatory" ensures that program and project managers possess the common skill and experience necessary for successful performance. Providing courses that are "optional" permit skill and experience to go undeveloped and, consequently, contribute to poor program and/or project management. DAU core-plus training for IT covers the same program management competencies as FAI throughout three levels. Leadership is covered during Level 3. As stated earlier, leadership is the most important skill when managing a program or project and should be introduced at Level 1—not Level 3. DAU does not have a published competency guideline to indicate what general and technical competencies need to be demonstrated

before obtaining the next level of certification. DAU's core certification standards are geared toward meeting training and experience objectives. DAU does not specify what type of IT acquisition experience is required to meet the certification standard for any level. This shortcoming is another area that can go unchecked. Some DAU core-plus training requires a formal education; whereas, FAI has no such requirement on any of its PM courses. This deficiency can be seen as another reason for poor performing IT programs or projects within DOD.

### 2.	DAU IT vs. Non-IT PM Certification

The IT PM core certification standards lack the mandatory PM training necessary to succeed at managing IT programs and projects. The training that provides knowledge, skill, and experience for managing programs and projects is not required in order to achieve a Level 3 certification. The IT core certification standard should include more mandatory training that would prepare an IT PM to take on an IT project and have more than just the fundamentals of acquisition management. When analyzing the program management certification standards, the process ensures that if some core-plus training is missed, the training becomes mandatory before certifying to the next level. Take contracting for example. The training is considered optional for Level 1 certification, but it is mandatory for Level 2. Developing the knowledge, skill, and experience in this field contributes tremendously to ensuring IT requirements are well-written. IT PMs with contracting experience are better equipped to help translate business and technical requirements into a statement of work that can help ensure a smooth procurement. Additionally, a well-written contract could accommodate the rapid change in technology and not require a contract modification later in the program. The only time contracting is offered to the IT PM is during Level 1 optional training. Information Assurance (IA)— now known as Cybersecurity—is offered as optional training for IT PM Level 2. This training should be part of the core certification standards for IT PM Level 1. It is offered as optional training for PM Level 1. IA is important because PMs must ensure IA requirements are identified and included throughout a system's life cycle. The DAU IT PM core certification standards lack the mandatory PM training necessary. This leaves IT

PMs with inadequate skill and experience necessary for managing successful IT programs and projects.

D. CYBERSECURITY/INFORMATION ASSURANCE (IA) CERTIFICATION

Nothing separates an IT PM from a non-IT PM with respect to cybersecurity. A PM running a Major Defense Acquisition Program (MDAP) will have to meet the same cybersecurity requirements as an IT PM in-charge of a Major Automated Information Systems (MAIS) program. As stated in Chapter III, all program managers must ensure cybersecurity requirements are identified and included throughout the life cycle of a system. According to DODI 8500.01, acquisition personnel with IT development responsibilities shall be IA-qualified in accordance with DOD 8570.01-M, the IA Workforce Improvement Program. The IA Management (IAM) category is the logical position to apply for a PM. This position is considered to be the baseline for DOD requirements. A PM can obtain three levels of IAM. Once assigned to a position, a PM has six months to achieve the appropriate certification for that level. Program managers in the IAM category must remain certified during their time in that position or risk losing their certification status.

As of March 14, 2014, Information Assurance has been renamed to Cybersecurity. The term "cybersecurity" has been adopted from the National Security Presidential Directive-54/Homeland Security Presidential Directive-23 and is to be used throughout DOD instead of the term "information assurance (IA)."

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V.   CONCLUSION

A.   SUMMARY

The primary objective of this thesis was to explore the differences between IT program management and non-IT program management through the analysis of three categories: competencies, certifications, and regulatory guidelines and policies. The first area analyzed was the general and technical competencies listed in the IT program management competency model. The technical competency model revealed more common program management knowledge and skill than technical skill. This made the general competency model more important when managing an IT program or project. The second area analyzed was the certification curriculum provided by DAU and FAI for IT PMs. DAU and FAI share similarities and differences in developing and strengthening IT PMs, but FAI requires a more demanding prerequisite by concentrating on the seven core program management competencies. The last area analyzed was the regulatory guidelines and policies for the acquisition and management of IT systems. Three of the guidelines directly relate to IT program management, while the remaining policies focus on the acquisition and management of IT systems. Based on the results of the three categories analyzed, more similarities than differences exist between IT and non-IT program management. Each category requires the same knowledge and skill of fundamental program management principles. A program manager who can combine the fundamental principles—cost, schedule, and scope management—with interpersonal skills—leadership, communication, influencing, negotiating, conflict management, and team building—seems to more effectively manage any program or project.

Managing the acquisition of IT systems continues to be a challenge for the federal government every year. Although OMB has launched several initiatives to improve the management and oversight of IT acquisitions, there is still room for improvement. Creating a specialized career path and competency model for IT PMs was a great start, but the focus should be on developing and strengthening general competencies for all program managers. Numerous organizations train program managers on the technical and

managerial competencies of program management, but what training exists with focus on developing and strengthening general competencies?

B. RECOMMENDATIONS FOR FURTHER STUDY

As shown in this research, a program manager can successfully manage an IT program or project by combining program management knowledge and skills with interpersonal skills. Future research could explore the DAU and FAI courses currently available that provide training on developing the general competencies listed in the IT program management competency model. If no courses exist, research could determine what additional training could be implemented to develop the general competencies of program managers.

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